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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/297,483	07/19/1999	SHUNICHI SEKI	005317-20009	9831

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EXAMINER

CLEVELAND, MICHAEL B

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 02/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/297,483

Applicant(s)

SEKI ET AL.

Examiner

Michael Cleveland

Art Unit

1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 37-49, 51, 53, 54, 62, 64, 66, 83-97 and 113-128 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 37-49, 51, 53, 54, 62, 64, 66, 83-97 and 113-128 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

Art Unit: 1762

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 113-127 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al. Nagayama et al. (U.S. Patent 5,701,055, hereafter '055) in view of Woo et al. (U.S. Patent 6,169,163, hereafter '163).

Claims 113 and 126: '055 teaches an organic electroluminescent (EL) element, having a stacked structure including a hole-transporting layer and a light-emitting layer formed within a partitioning member which is divided into individual pixel areas, manufactured by a process comprising:

forming a plurality of anode layers (3);

forming a partitioning member (7, 40) above a substrate (2), the partition member lying at least between adjacent ones of the plurality of anode layers so as to independently partition the adjacent ones of the plurality of anode layers (See Fig. 19 and col. 13, lines 49-col. 14, line 6) whereby a plurality of having openings over at least a portion of the anode layer, the openings corresponding to pixel areas (See Fig. 5C, Figs. 8A-8C, Fig. 19);

forming a hole-transporting layer and light-emitting layer (two parts of organic layer 8, col. 6, lines 31-59), which are deposited by independently filling each of the openings with the

Art Unit: 1762

hole-transporting composition (col. 8, lines 41-62), wherein a height of the hole-injecting or transporting layer and the light-emitting layer (and the cathode) is less than that of the partitioning member; and

forming a cathode layer (9) over the light-emitting layer (col. 9, lines 20-52).

'055 does not teach that the hole-injecting layer contains a conductive material comprising polyethylene dioxythiophene (PEDT) and polystyrene sulfonic acid (PSS). However, the selection of something based on its known suitability for its intended use has been held to support a *prima facie* case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See MPEP 2144.07. '163 teaches the use of PEDT doped with PSS as a hole-transporting layer for organic EL devices (col. 21, lines 10-20). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used PEDT doped with PSS as the particular hole-transporting material of '055 with the expectation of similar results and with a reasonable expectation of success because '163 teaches that it is an operative hole-transporting material.

From MPEP 2113: "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted). It is clear that the solvent does not form part of the product because the process recites the step of drying. It is unclear whether the drying removes the lubricant or not. However, the lubricant does not appear to serve any function in the electronic device and therefore, in the absence of a showing of a material difference in the product from the presence of the lubricant, the claims are unpatentable over this combination.

Claims 114-120: There is no evidence that the use of particular concentrations, contact angles, viscosities, and surface tensions of the coating solutions cause a structural difference in the formed product.

Claims 121-125: Likewise, the identity of the solvent does not appear to materially affect the dried product, and therefore the product appears to be identical regardless of which solvent is used to deposit the layers.

Claim 127: '163 teaches a preferred thickness of the PEDT-PSS layer of 100 nm (0.1 microns) (col. 21, lines 14-20).

Art Unit: 1762

4. Claims 37-49, 51, 53, 62, 64, 66, 83-96, and 113-127 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagayama '055 in view of Woo '163, as applied to claim 113, above, and further in view of Jonas (U.S. Patent 5,766,515, hereafter '515), Taniguchi et al. (U.S. Patent 5,667,572), and Roitman (U.S. Patent 5,972,419, hereafter '419).

Claims 37, 48-49, 51, 64, 66, 93-95, 124-126: '055 and '163 are discussed above. '055 teaches vapor deposition of the hole-transporting materials. '163 teaches spin coating of PEDT-PSS. Therefore, they do not teach applying a solution of PEDT-PSS, a solvent, and a lubricant by ink-jet printing.

'515 teaches that a polythiophene films suitable for deposition in EL devices (col. 3, lines 5-67) are formed using compositions including PEDT and PSS and a solvent (Example and claims 1 and 3). '515 teaches that such compositions may be applied by liquid coating methods including printing methods (col. 2, lines 51-57). '515 teaches that the applied film is then dried (col. 2, lines 51-57). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have dried the film after depositing it.

'515 teaches that the solvent for the polythiophene (i.e., an ionic polymer) dispersion (i.e., ink) may be a mixture of water with water-miscible solvents, but none of the references suggest ethoxyethanol, diethylene glycol, or glycerin.

'572 teaches the preparation of inks that contain ionic polymers (col. 8, lines 13-32) may be made in mixtures containing water-miscible organic solvents, such as glycerin, diethylene glycol and ethoxyethanol (col. 7, lines 31-57). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used such water-miscible solvents as ethoxyethanol, diethylene glycol, or glycerin as the solvents mixed with water in the polythiophene inks of '515 with the expectation of similar results.

'055 teaches the deposition of multiple colors of electroluminescent materials between '055, '163, '515, and '572 do not teach that the light-emitting layer is deposited by ink-jet printing. However, Roitman '419 demonstrates that it is known to deposit multiple colors of electroluminescent materials between barriers using ink-jet printing (col. 3, lines 1-50). The selection of something based on its known suitability for its intended use has been held to support a *prima facie* case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See MPEP 2144.07. . Therefore, it would have been obvious

Art Unit: 1762

to one of ordinary skill in the art at the time the invention was made to have deposited the EL material via ink-jet printing with a reasonable expectation of success because Roitman indicates that ink-jet printing is a suitable method of depositing EL materials.

Claims 38-44, 83-89, 114-120: The Examiner takes Official Notice that factors such as the flowability of an ink and its wetting ability on a surface are well known parameters in coating processes. The flowability and wetting ability are controlled by the viscosity, surface tension, and contact angle with any dispensing nozzle of the solution. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have optimized the viscosity, surface tension, and contact angle with the ink-jet nozzle for the optimum flow and wetting properties. The composition of Example 1 of '515 has a weight percent within Applicant's claimed ranges (about 0.5 %).

Claims 45-47, 90-92, 121-123: The solvent may be polar solvents, such as water, or water mixed with lower alcohols, such as ethanol ('515, col. 2, lines 11-16).

Claims 53, 96, 127: '163 teaches a preferred thickness of the PEDT-PSS layer of 100 nm (0.1 microns) (col. 21, lines 14-20).

Claims 62: The electroluminescent elements form a luminescent screen, and are therefore incorporated in a luminescent display.

Claims 121-125: The solvent may be polar solvents, such as water, or water mixed with lower alcohols, such as ethanol ('515, col. 2, lines 11-16). However, the identity of the solvent does not appear to materially affect the dried product, and therefore the product appears to be identical regardless of which solvent is used to deposit the layers.

Claims 127: Thicknesses of less than 1 micron are taught in '515, col. 3, lines 66-67.

5. Claims 54, 97, and 128 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagayama '055 in view of Woo '163, and further in view of Jonas '515, Taniguchi '572, and Roitman '419 as applied to claims 37, 62, and 113, above, and further in view of Jonas (U.S. Patent 6,004,483, hereafter '483).

'055, '163, '515, '572, and '419 are discussed above but do not explicitly teach surface resistances within Applicant's claimed ranges. However, Jonas '483 indicates that similar polythiophene films to Jonas '515 can be printed with surface resistances of 10^{10} to 0.1

Art Unit: 1762

ohm/square (col. 4, lines 35-36), which overlaps Applicant's claimed range. The subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a *prima facie* case of obviousness, see *In re Malagari*, 182 U.S.P.Q. 549.

Response to Arguments

6. Applicant's arguments filed 12/9/03 have been fully considered but they are not persuasive.

Applicant argues that Nagayama does not teach that the partition layers are located between the anode layers, citing Figs. 5 and 8. The argument is unconvincing because Fig. 19 and col. 13, lines 49-col. 14, line 6 teach that supporting walls may run parallel to and between both the anodes and the cathodes.

Applicant argues that p. 4, lines 9-22 of the specification attribute more efficient and economical manufacturing to this feature. The argument is unconvincing because the specification does not make clearly make any attribution of improvements to the feature of partition layers between anodes and because the feature does not represent a difference between the claims and the primary reference.

Applicant argues that the contact angles, viscosities, and surface tensions have an effect on the physical properties of the formed product, as described at pp. 5-9 of the specification. The discussion of contact angle, viscosity, and surface tension each discuss only the features of the process of ink-jet printing and not to the features of an EL device. Furthermore, the assertions of advantage are unsupported by a showing of evidence which is commensurate in scope with the claims. Furthermore, the argument does not address the further obviousness rejections. See remarks regarding claims 38-44.

Applicant argues that the solvent has an effect on the physical properties of the formed product, as described at pp. 21 of the specification. The argument is unconvincing because "film forming properties" are the properties of the process of forming the film, and not of the formed product. Furthermore, the assertions of advantage are unsupported by a showing of evidence which is commensurate in scope with the claims.

Art Unit: 1762

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Cleveland whose telephone number is (571) 272-1418. The examiner can normally be reached on Tuesday-Friday and alternate Mon, 8-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (703) 272-1415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Michael Cleveland
Patent Examiner
February 9, 2004